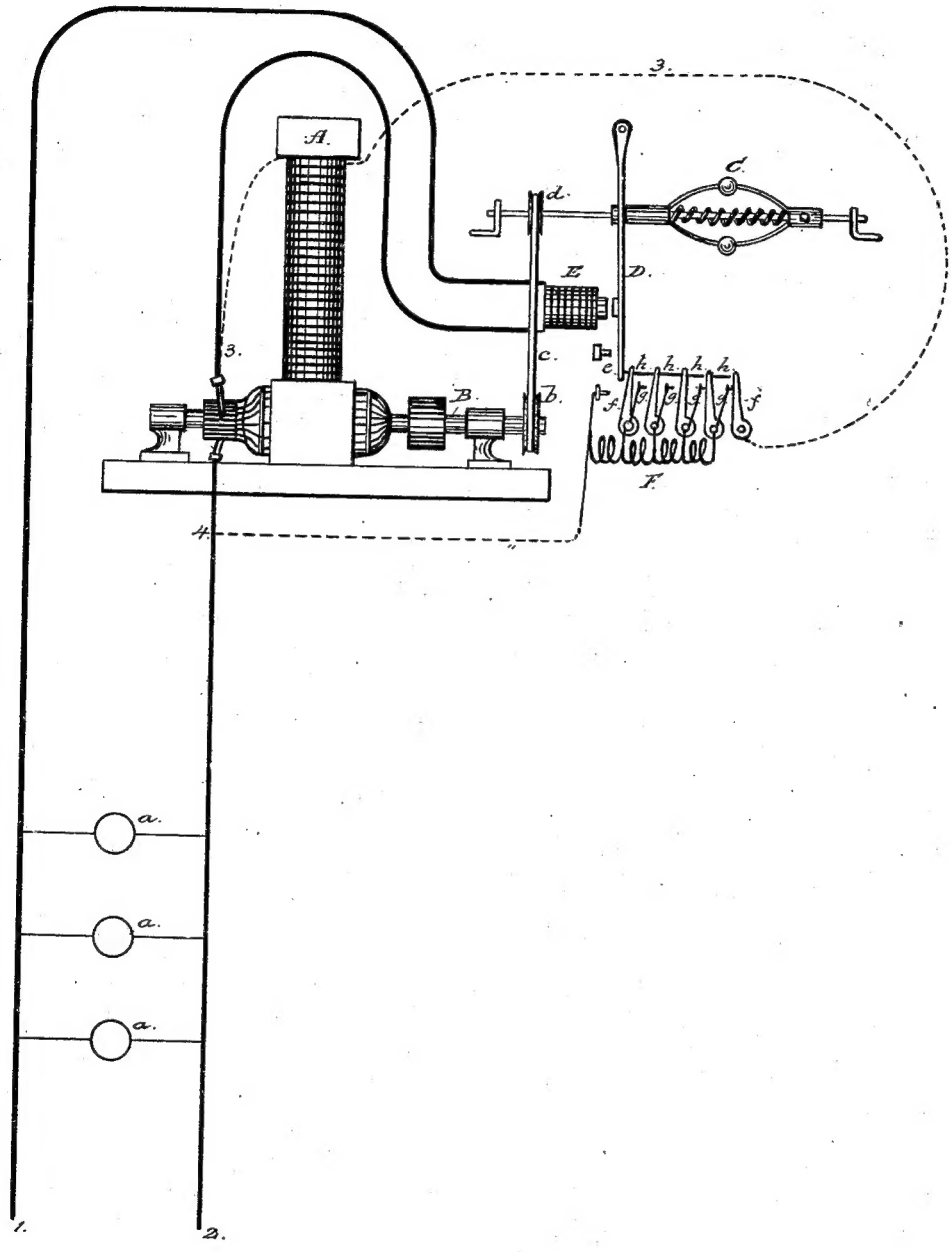
(No Model.)

T. A. EDISON.

REGULATOR FOR DYNAMO ELECTRIC MACHINES.

No. 264,665. Patented Sept. 19, 1882.



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UNITED STATES PATENT OFFICE.

THOMAS A. EDISON, OF MENLO PARK, NEW JERSEY.

REGULATOR FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 264,665, dated September 19, 1882.

Application filed August 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, of Menlo Park, in the county of Middlesex and State of New Jersey, have invented a new and useful Improvement in the Regulation of Dynamo or Magneto Electric Machines, (Case No. 414;) and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

The object of this invention is to produce a regulating apparatus for dynamo and magneto electric machines which shall regulate the generation of current either for variations in the number of translating devices in circuit from the machine or for variations in the speed of the steam-engine or other motor used to rotate the armature of the machine. Such apparatus consists, generally speaking, of an adjustable resistance in the field-circuit of the machine and a movable arm, by means of which portions of such resistance are placed in or taken out of circuit, the means for moving such arm being, first, a centrifugal governor attached to and operated by any moving part of the generating apparatus, thus regulating for variations of speed; and, second, an electro-magnet placed directly in the main circuit from the generator, or else in a shunt therefrom, and in such position as to attract the movable arm when sufficiently energized.

A convenient form of my invention is shown diagrammatically in the accompanying drawing.

A is a dynamo-electric machine, from which lead main conductors 1 2, having translating devices *a a* arranged upon them in multiple arc. The multiple-arc circuit 3 4 (shown in dotted lines) is the field-circuit energizing the magnet of the machine.

On the armature-shaft B is mounted a pulley, *b*, from which a belt, *c*, passes over the pulley *d* on the shaft of a centrifugal governor, C.

Attached to the governor C, and moved back and forth by it, is an arm, D, whose lower end, *e*, is opposite the free ends of the series of spring-retracted contact-levers *f f*. These open and close circuit at points *g g*, according as they are thrown forward by the arm D or drawn back by their springs, *h h* being pins of insulating material. The adjustable resistance F is connected in the field-circuit of the machine, as shown, so that when an arm, *f*, is in contact with its stop *g* the corresponding portion of the resistance is short-circuited.

Directly in the main circuit 1 2 is placed an electro-magnet, E, the poles of which are opposite the arm D, so that it will attract said arm when sufficiently energized, and thus allow the contact-levers *f f* to make contact with the points *g g*. Normally—that is, when few lamps *a* are in circuit and the engine is running at its proper speed—a portion of the resistance F is in circuit, as shown in the drawing. Should this small number of lamps be still further reduced, the magnet E will weaken and release the arm D, so as to open circuit at more of the points *g* and throw more of the resistance F into the field-circuit; or should the speed of the engine suddenly increase from any cause the same effect would be produced, the drawing up of the governor-balls pulling forward the arm D. Should, however, the number of translating devices in circuit be increased, the energy of the magnet E will also become greater, and the arm D will be drawn back, closing one or more circuits at *g* around portions of the resistance F and properly increasing the energy of the field-magnet. The same effect is produced by a decrease in the speed of the engine actuating the armature, the governor C pushing the arm D back, so as to close circuits around portions of the resistance. It is evident that the governor C could be run from the engine-shaft instead of from that of the armature, or, if desired, from any other moving portion of the apparatus.

The circuit 3 4, instead of being a multiple-arc circuit from the main, could be a shunt therefrom, or a circuit supplied from another dynamo-machine or other suitable external source.

The arrangement of resistances and contact-arms could of course be varied in many ways, if desired.

What I claim is—

1. The combination of a dynamo or magneto electric machine, an adjustable resistance in its field-circuit, a movable arm for varying such resistance, mechanical means connected with and actuated by a moving portion of the ma-

chine or of the motor which drives it, for moving said arm to vary said resistance, and means actuated by the current generated, also for moving said arm to vary the resistance, substantially as set forth.

2. The combination of a dynamo or magneto electric machine, an adjustable resistance in its field-circuit, a movable arm for varying such resistance, mechanical means connected with and actuated by some moving portion of the apparatus for moving said arm to vary the resistance, and an electro-magnet in the main circuit or in a shunt therefrom, also for moving said arm to vary the resistance, substantially as set forth.

3. The combination of a dynamo or magneto electric machine, an adjustable resistance in its field-circuit, a movable arm for varying such resistance, a centrifugal governor connected with and actuated by some moving portion of the apparatus, and also connected with said arm, so as to move it back and forth, and an electro-magnet energized by the current generated, and also adapted to move said arm back and forth, substantially as set forth.

This specification signed and witnessed this 1st day of May, 1882.

THOMAS A. EDISON.

Witnesses:
H. W. SEELY,
P. B. WILBER.